

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (canceled)

Claim 2 (canceled)

Claim 3 (canceled)

4. (currently amended) A magnetic head having a magnetoresistive film comprising an anti-ferromagnetic layer, a ferromagnetic pinned layer, a non-magnetic intermediate layer, a soft magnetic free layer, a non-magnetic conductive oxidized stopper layer, and an oxide protective layer of metal selected from Ta, Nb, Ti, ~~Ff~~ Hf, W or an alloy thereof laminated in this order on a substrate, wherein the oxide protective layer is substantially oxidized entirely, and wherein an intermediate layer coupling field showing a magnitude of the ferromagnetic coupling between the ferromagnetic pinned layer and the soft magnetic free layer is substantially zero.

Claim 5 (canceled)

Claim 6 (canceled)

7. (previously presented) A magnetic head as defined in claim 4, wherein the thickness of the metal oxide protective layer is 1.0 nm or less.

8. (currently amended) A magnetic recording apparatus including a magnetic recording medium for recording information, a magnetic head having a magnetoresistive film comprising an anti-ferromagnetic layer, a ferromagnetic pinned layer, a non-magnetic intermediate layer, a soft magnetic free layer, a non-magnetic ~~and~~-conductive oxidized stopper layer, and an oxide protective layer of metal selected from Ta, Nb, Ti, Hf, W or an alloy thereof laminated in this order on a substrate, a head slider for holding the magnetic head, an actuator for guiding the head slider to a predetermined recording position on the recording medium, a spindle motor rotating the recording medium and a signal processing system for processing information read out of the magnetic recording medium, wherein the oxide protective layer is substantially oxidized entirely, and wherein an intermediate layer coupling field showing a magnitude of ~~the~~-ferromagnetic coupling between the ferromagnetic pinned layer and the soft magnetic free layer is substantially zero.

9. (currently amended) A magnetic head as defined in claim 4, wherein the non-magnetic ~~and~~-conductive oxidized stopper layer substantially prevents at least one of diffusion of oxygen from the metal oxide protective layer and propagation of stresses caused by oxides with respect to the soft magnetic free layer and degradation of a soft magnetic characteristic of the soft magnetic free layer.

10. (previously presented) A magnetic recording apparatus as defined in claim 8, wherein the non-magnetic conductive oxidized stopper layer substantially prevents at least one of diffusion of oxygen from the oxide protective layer and propagation of stresses caused by oxides with respect to the soft magnetic free layer and degradation of a soft magnetic characteristic of the soft magnetic free layer.

11. (currently amended) A magnetic head as defined in claim 4, wherein the non-magnetic ~~and-conductive~~ oxidized stopper layer has a thickness so that the intermediate layer coupling field showing the magnitude of ferromagnetic coupling between the ferromagnetic pinned layer and the soft magnetic free layer is substantially zero.

12. (currently amended) A magnetic head as defined in claim 11, wherein the thickness of the non-magnetic ~~and-conductive~~ oxidized stopper layer enables a change of resistance (ΔR) to be maximized.

13. (currently amended) A magnetic recording apparatus as defined in claim 8, wherein the non-magnetic ~~and-conductive~~ oxidized stopper layer has a thickness so that the intermediate layer coupling field showing the magnitude of ferromagnetic coupling between the ferromagnetic pinned layer and the soft magnetic free layer is substantially zero.

14. (currently amended) A magnetic recording apparatus as defined in claim 13, wherein the thickness of the non-magnetic ~~and-conductive~~ oxidized stopper layer enables a change of resistance (ΔR) to be maximized.

15. (currently amended) A magnetic head as defined in claim 4, wherein the non-magnetic ~~and-conductive~~ oxidized stopper layer is made of Cu.

16. (currently amended) A magnetic head as defined in claim 11, wherein the non-magnetic ~~and-conductive~~ oxidized stopper layer is made of Cu.

17. (previously presented) A magnetic recording apparatus as defined in claim 8, wherein the non-magnetic conductive oxidized stopper layer is made of Cu.

18. (previously presented) A magnetic recording apparatus as defined in claim 13, wherein the non-magnetic conductive oxidized stopper layer is made of Cu.

19. (new) A magnetic recording apparatus according to claim 8, wherein the thickness of the oxide protective layer is 1.0 nm or less.